Thursday 25 May 2017  Morning  Time allowed: 1 hour 30 minutes

Materials
For this paper you must have:
• mathematical instruments.

You must not use a calculator.

Instructions
• Use black ink or black ball-point pen. Draw diagrams in pencil.
• Answer all questions.
• You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
• Do all rough work in this book. Cross through any work you do not want to be marked.

Information
• The marks for questions are shown in brackets.
• The maximum mark for this paper is 80.
• You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.

Advice
• In all calculations, show clearly how you work out your answer.
1. How many minutes are there in $3\frac{1}{2}$ hours?
   Circle your answer. [1 mark]
   - 180.5
   - 210
   - 330
   - 350

2. Work out $\frac{1}{4} + 0.5$
   Circle your answer. [1 mark]
   - 0.30
   - 0.6
   - 0.75
   - 0.9

3. Which of these shapes has the most sides?
   Circle your answer. [1 mark]
   - Hexagon
   - Octagon
   - Rhombus
   - Trapezium
4 Solve \( x - 3 = 0 \)
Circle your answer.

[1 mark]

\[ x = -3 \quad x = 0 \quad x = \frac{1}{3} \quad x = 3 \]

5 Work out \( 58 \times 73 \)

[3 marks]

Answer ________________
6 500 people are asked if they drink coffee.

\[
\frac{9}{10} \text{ say Yes.}
\]

20% of the people who say Yes drink at least three cups each day.

6 (a) Complete the frequency tree.

[4 marks]
6 (b) What fraction of the 500 people drink at least three cups of coffee each day? Give your answer in its simplest form. [2 marks]

Answer

7 By rounding each number to the nearest 10, estimate the answer to \( \frac{61 \times 47}{102} \).

You must show your working. [2 marks]

Answer

Turn over for the next question
Nadia has £5 to buy pencils and rulers.

<table>
<thead>
<tr>
<th>Prices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pencils</td>
</tr>
<tr>
<td>Rulers</td>
</tr>
</tbody>
</table>

She says,

“I will buy 15 pencils.
Then I will buy as many rulers as possible.
With my change I will buy more pencils.”

How many pencils and how many rulers does she buy? [6 marks]

Answer ___________ pencils, ___________ rulers
9. Work out \( 25.68 \div 12 \) [2 marks]

Answer ________________________________

10. Work out \( \frac{3}{8} \times 11 \)

Give your answer as a mixed number. [2 marks]

Answer ________________________________
11 A triangle has perimeter 32 cm

A square has perimeter 40 cm

Two sides of the shapes are put together to make a pentagon.
Work out the perimeter of the pentagon. [4 marks]

Answer __________________________ cm

Turn over for the next question
12 A football team has $P$ points.

\[ P = 3W + D \]

$W$ is the number of wins
$D$ is the number of draws

12 (a) A team has 6 wins and 2 draws.

How many points does the team have? [1 mark]

Answer

12 (b) After 33 games a different team has 53 points.

11 games were draws.

How many games has this team lost? [4 marks]

Answer
Make the following calculations correct.
Use only the symbols $+, -, \times, \div$ and $( )$

$2 + 0 + 1 + 7 = 10$

$2 + 0 + 1 + 7 = -4$

$2 + 0 + 1 + 7 = 0$

$2 + 0 + 1 + 7 = 2^4$

Turn over for the next question
A number is picked at random from the first four **prime** numbers.

A number is picked at random from the first four **square** numbers.

The two numbers are added to get a score.

### 14 (a) Complete the table.

#### [4 marks]

<table>
<thead>
<tr>
<th>Prime numbers</th>
<th>1</th>
<th>4</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 14 (b) What is the probability that the score is a **prime** number?

#### [1 mark]

Answer: ________________________________
In a school show,

girls : boys = 1 : 1

girls who sing : girls who do not sing = 1 : 2

8 girls sing in the show.

How many students are in the show altogether?

[3 marks]

Answer __________________________________________

Turn over for the next question
16  \( P \) and \( Q \) are points on the line \( 3x + 2y = 6 \)

16 (a) Complete the coordinates of \( P \) and \( Q \). [2 marks]

\[ P (0, \_\_\_\_) \quad Q (\_\_, 0) \]

16 (b) Draw the line \( 3x + 2y = 6 \) for values of \( x \) from \(-3\) to \(3\). [2 marks]
17 Circle the expression which does not simplify to $y^3$

$y \times y \times y \quad y^4 + y \quad y^2 \times y \quad y^8 + y^2$

[1 mark]

18 Write the number six million five thousand two hundred in standard form.

[2 marks]

Answer

Turn over for the next question
19 (a) Use $8 \text{ km/h} = 5 \text{ mph}$ to convert $96 \text{ km/h}$ to mph

Answer

19 (b) $x \text{ km/h} = y \text{ mph}$

Use $8 \text{ km/h} = 5 \text{ mph}$ to write a formula for $y$ in terms of $x$.

Answer
20 Here is a circle touching a square.

The area of the square is $64\, \text{cm}^2$

Work out the area of the circle.

Give your answer in terms of $\pi$.

[3 marks]

Answer ___________________ $\text{cm}^2$

Turn over for the next question
21 Billy wants to buy these tickets for a show.
   4 adult tickets at £15 each
   2 child tickets at £10 each

   A 10% booking fee is added to the ticket price.
   3% is then added for paying by credit card.

   Work out the total charge for these tickets when paying by credit card. [5 marks]

Answer £ ____________________________
22 (a) Density = \( \frac{\text{mass}}{\text{volume}} \)

The mass of solid A is 6 times the mass of solid B.
The volume of solid A is 3 times the volume of solid B.

Complete the sentence. [1 mark]

The density of solid A is \( \underline{\underline{\text{\phantom{00}}}} \) times the density of solid B.

22 (b) Average speed = \( \frac{\text{distance}}{\text{time}} \)

If the distance is halved and the time is doubled, what happens to the average speed? Circle your answer. [1 mark]

\( \times 2 \) \( \times 4 \) \( \text{no change} \) \( \div 2 \) \( \div 4 \)

Turn over for the next question
A regular polygon has an exterior angle of $20^\circ$

Work out the number of sides of the polygon. [2 marks]

Answer

\[
\frac{1}{2} : \frac{2}{3} = x : 1
\]

Circle the value of $x$. [1 mark]

\[
\frac{1}{3} \quad \frac{3}{5} \quad \frac{3}{4} \quad \frac{4}{3}
\]
The table shows information about the times for 10 people to complete a task.

<table>
<thead>
<tr>
<th>Time, $t$ (minutes)</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0 &lt; t \leq 20$</td>
<td>1</td>
</tr>
<tr>
<td>$20 &lt; t \leq 40$</td>
<td>6</td>
</tr>
<tr>
<td>$40 &lt; t \leq 60$</td>
<td>3</td>
</tr>
</tbody>
</table>

These statements are about the mean and range of the actual times. Tick the correct box for each statement. [4 marks]

<table>
<thead>
<tr>
<th>Statement</th>
<th>True</th>
<th>False</th>
</tr>
</thead>
<tbody>
<tr>
<td>The mean could be less than 20 minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The mean could be more than 40 minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The mean could be less than 40 minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The range could be more than 40 minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The range could be less than 40 minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The range could be more than 60 minutes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
26 Write 36 as a product of prime factors.
Give your answer in index form. [3 marks]

Answer

27 Circle the value of \( \cos 90^\circ \) [1 mark]

\[
\begin{array}{c|c|c|c}
0 & \frac{1}{2} & \frac{\sqrt{3}}{2} & 1 \\
\end{array}
\]
28 Solve the simultaneous equations.

\[
\begin{align*}
2x + y &= 18 \\
x - y &= 6
\end{align*}
\]

[3 marks]

Answer ____________________________

END OF QUESTIONS